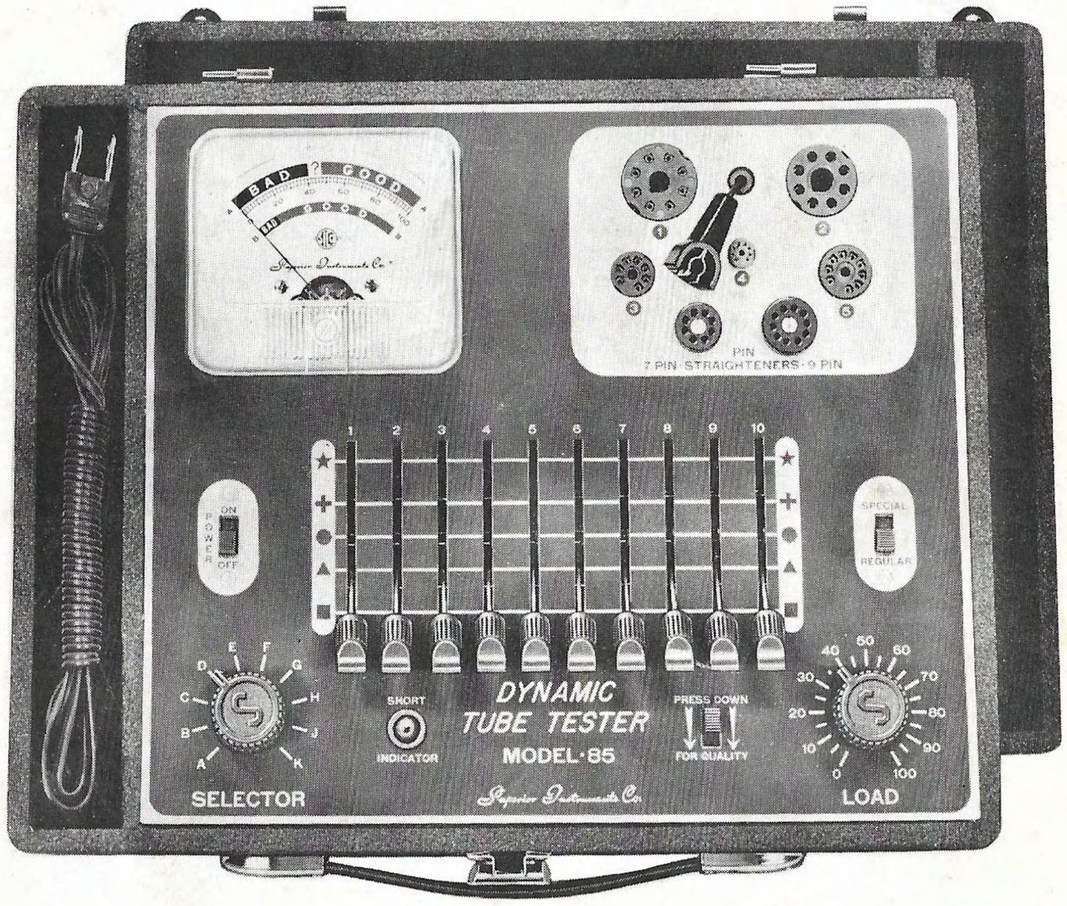
OPERATING INSTRUCTIONS

FOR MODEL 85

DYNAMIC TUBE TESTER



MANUFACTURED BY

SUPERIOR INSTRUMENTS CO.
2435-41 WHITE PLAINS ROAD NEW YORK 67, N.Y.

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THE MODEL 85 is a professional tube tester redesigned to permit the dynamic (under simulated conditions) tests of radio and TV receiver tubes by semi-skilled or non-technical users. All switching has been reduced to an absolute minimum while still maintaining professional results and assurance against obsolescence.

Simplification of switching and controls has enabled us to present operating instructions in a simple, easy to understand style.

On the following pages, we have illustrated procedures wherever possible. We suggest you study the data and the instrument panel before you attempt to use the instrument. The 10 minutes spent in doing so will be well invested; for if you acquire a proper understanding of how this model operates, it will become your most frequently used and indispensable tool.

As in all better professional types of tube testers, the Model 85 provides the means of making the three basic tube tests:

1. Tests for internal shorts and leakages
2. Tests for filament continuity
3. Tests for quality in a circuit that simulates the normal circuit in which the tube is used.

The operating instructions have been so written that (so long as our recommended procedure is followed) it will be difficult to damage the instrument. The tests for shorts, leakage and filament continuity are automatically made before the quality test. A spring return quality switch is also used as added precaution to prevent the application of heavy current to the meter test circuit if an element in the tube under test is shorted.

PLEASE...

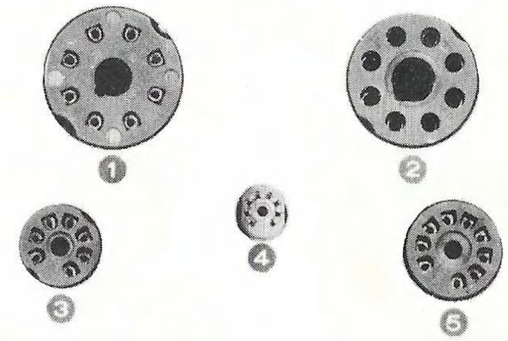
Read this and the following pages **before** you attempt to use your Model 85.

These pages include a detailed description of the various front panel components and the manner in which they function.

You can get the most out of your instrument (any device in fact) if you fully understand the technical function of the various components. A detailed explanation of the front panel switches and controls appears herewith.

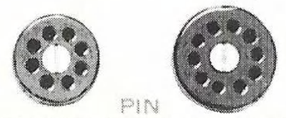
TUBE SOCKETS

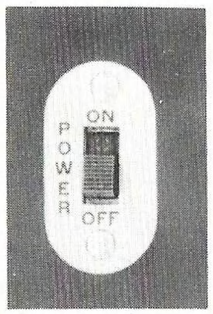
Always check to see if you are inserting the tube correctly in its proper socket. Attempting to force a tube into the wrong socket may damage both.



PIN STRAIGHTENERS

The Model 85 has a 7-pin straightener below its #3 socket and a 9-pin straightener under its #5 socket. **Do not** insert a tube in either the #3 (7 pin) socket or in the #5 (9 pin) socket before inserting it in its socket straightener. This will prevent broken glass bases on these tubes and prevent damaging the #3 or #5 sockets because of bent tube pins.





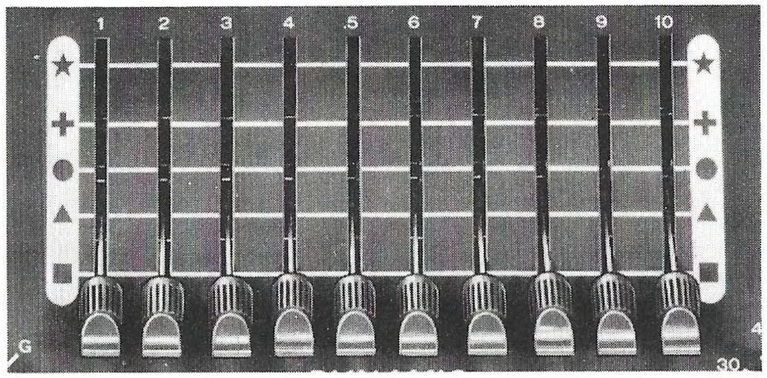
POWER SWITCH

The power switch is used to place the Model 85 in operating condition. Although no harm can befall the instrument if permanently connected to a power line, it is advisable to keep this switch in its "off" position when the instrument is not in use.

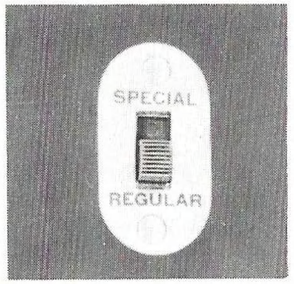
TOP CAP LEAD

This lead is always used if the tube under test has a top cap lead connection. If the tube under test does not have a top cap connection, do not allow this lead to contact any metal part of the instrument. This lead also terminates at the #10 lever of the elemental switches described below.

ELEMENTAL LEVER SWITCHES



The lever switches connect the various tube elements to their respective test circuits.

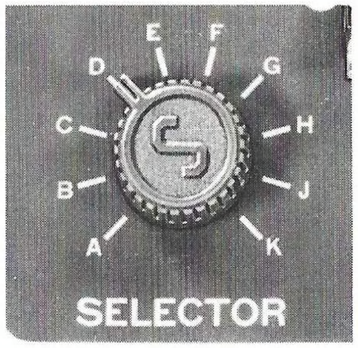


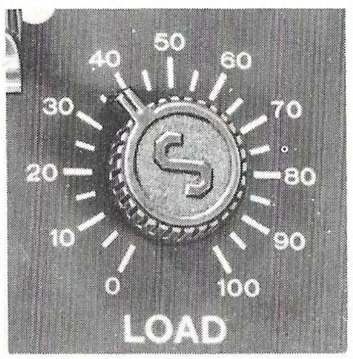
SPECIAL-REGULAR SWITCH

The "Special-Regular" switch selects the anode voltage necessary for correct operation of the tube under either dynamic or static tests. It is normally left in its "regular" position for most tubes.

SELECTOR SWITCH

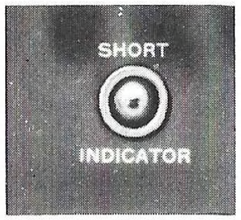
The selecor switch selects the correct operating voltage for the filament of the tube under test. **Do not under any circumstances** turn this switch **after** a tube is inserted into any of the test sockets. This switch is **always** set **before** inserting a tube. Failure to observe this precaution may result in a burned out tube.





LOAD CONTROL

The Load Control determines the amount of loading placed on the tube under test. Specifically it acts as a "bypass" for the current which would normally flow through the circuit. Since some tubes pass a greater current than others, the load control adjusts the correct operating point of the tube so that all readings can fall on the same portion of the meter scale for ease in evaluation. It can be likened to a water valve, which is "full off" at 100 causing all the power to go through the meter and "full on" at 0 letting only a small portion to flow through the meter circuit.

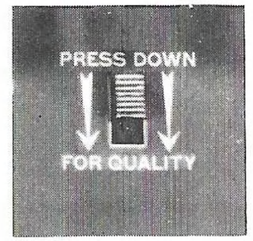


SHORT INDICATOR

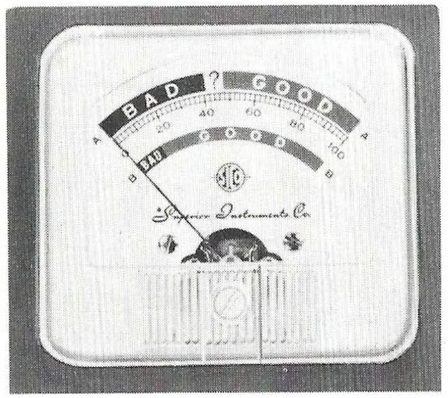
An inter-element short or leakage between elements is shown as a steady glow by the leakage indicator. A "flash" of the indicator when switches are moved may be disregarded as it is due to wiring and tube inter-electrode capacity. The leakage indicator lamp should light only when the element listed in the "Indicator should light" column of the chart is placed in the ▲ position. The lamp then is used to indicate filament continuity, one of the tests provided by the Model 85.

"PRESS DOWN FOR QUALITY" SWITCH

The "press down for quality" switch is a safety switch used to protect the meter from overload if a tube is shorted. In its normal up position, it connects the tube elements under test to the "short indicator" circuit through a protective capacitor. When pressed down for quality tests, it connects the meter into the circuit.



METER



The meter is used to indicate quality of the tube under test. It includes 3 calibrated scales. The topmost or "A" scale is used for most tube tests. These tubes have the letter A appearing in the last column of the chart. The Red section (Bad) indicates below normal quality. The White section (?) indicates low or questionable tube quality. The Green section (Good) indicates good tube quality.

The center or linear scale, printed in black, is a means of comparing the relative quality between tubes of the same type and number. The better the tube quality, the higher it will read on the scale.

The lower scale or "B" scale is used whenever the letter "B" appears in the last column of the chart. This scale is used to test tubes having relatively low cathode emission such as special high voltage TV rectifiers, battery tubes, and other special tubes. The scale markings are similar to the "A" scale.

The meter pointer should always rest at zero when the instrument is not in use. If the pointer should shift either above or below the zero mark, it can be adjusted by turning the zero adjustment screw located on the lower part of the meter front.

TUBE	SELECTOR	★	✚	SOCKET	INDICATOR SHOULD LIGHT	●	▲	LOAD	FUNCTION	READ SCALE
1H4	A	2		2	7	5	3	30	R	B
1H5	A	2		2	7	10	3	100	R	B
1H5	A	2		2	7		5	40	R	B
1J3	A	2	1, 3, 5, 8	2	7		10	20	S	B
1K3	A	2	1, 3, 5, 8	2	7		10	30	S	B
1L4	A	7	5	3	1	6	2, 3	30	R	B
1L6	A	7		3	1	4	3, 5	35	R	B

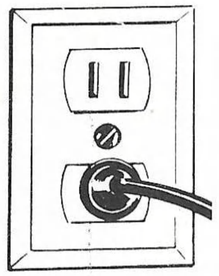
TUBE CHART

The chart used with the Model 85 has been designed for speed and accuracy in tube evaluation.

1st column (marked "Tube") — This column lists all the tubes that can be tested in an alphabetical-numerical order. **Tubes having more than one listing** (for example 12AU7) are multi-section tubes. **Each section must test good.**

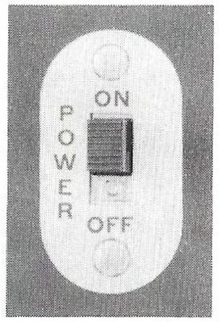
TO TEST A TUBE IN THE MODEL 85

1



Insert the line cord into any 110-120 volt AC line.

2



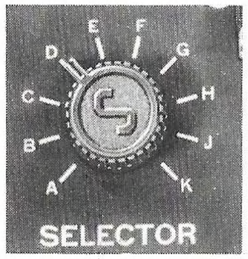
Place the "power" switch up to the "on" position.

3

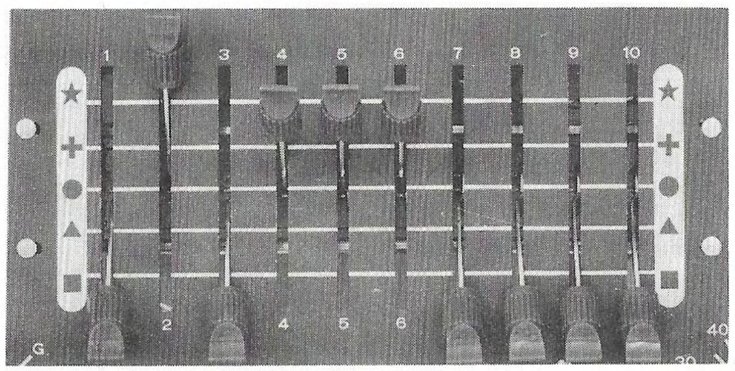
TUBE	SELECTOR	★	✚	SOCKET	INDICATOR SHOULD LIGHT	●	▲	LOAD	FUNCTION	READ SCALE
6DQ5	D	2	4, 5, 6	2	7	1	8, 10	15	R	A
6DQ6	D	2		2	7	5	4, 10	15	R	A
6DR7	D	4	3	5	5	2	1	15	R	A
6DR7	D	4	3	5	5	7	6	15	R	B
6DS5	D	3	7	3	4	1	5, 6	20	R	A
6D	D	4	6, 8			3	1, 9	85	R	A

Locate the tube to be tested on the tube chart. More than one listing indicates that the tube is a multi-section tube and each section must be tested separately.

4



Turn the "Selector" switch (A-K) to the position specified in the column headed "Selector."



5 Move the lever switch specified in the ★ column up to the ★ position.

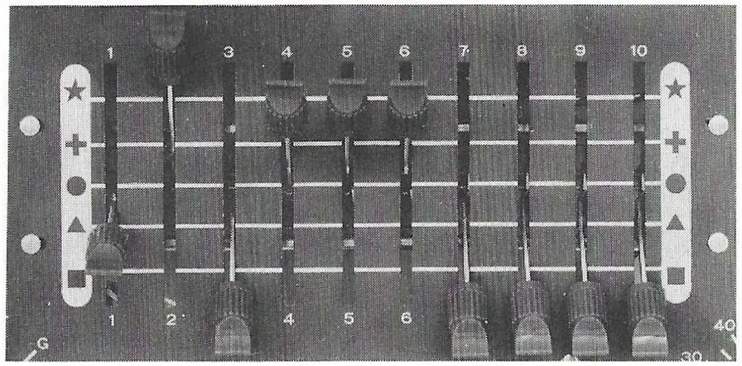
6 Move all the lever switches specified in the ✚ position to the ✚ position.

7 All other lever switches must be **down** in the ■ position.

8 Insert the tube under test into its correct socket (1-5) as designated in the column headed "Socket."

9 If the tube has a top cap, connect the top cap lead.

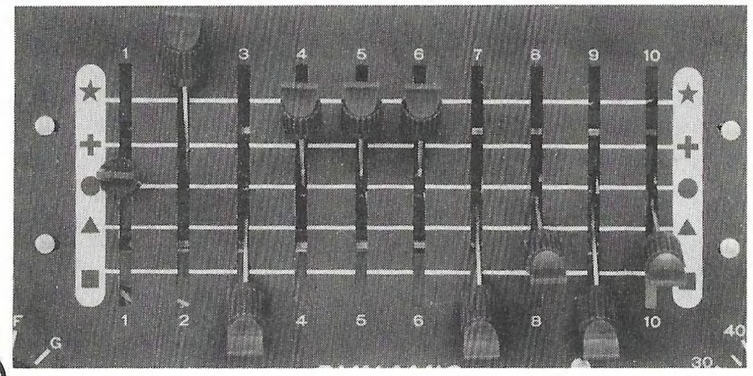
10



One at a time, move each lever not previously placed in either the ★ or ✚ positions up to the ▲ position and observe the "Short-Indicator" lamp.

A steady glow indicates that a short or leakage exists in the tube **except** if that levers appears in the "Indicator should light" column. **Be sure to move each lever back to the ■ before proceeding with the next lever.**

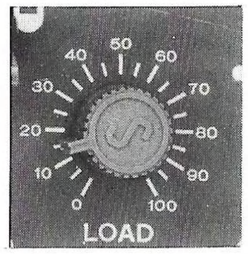
This completes the "Short" test. If the tube does not show a short except that which appears in the "Indicator should light" column, it is safe to continue with the quality test.



11 Move the lever specified in the ● column to the ● position.

12 Move all the levers specified in the ▲ column to the ▲ position.

13

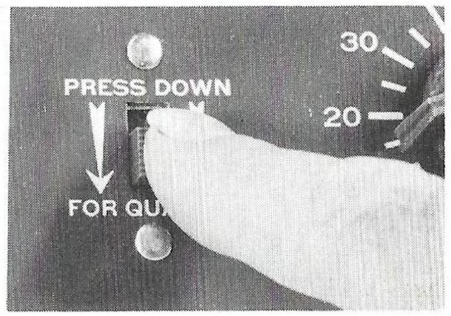


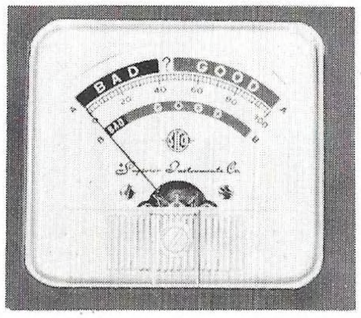
Set the "load" control to the setting designated in the "load" column.

14

Place the "Special-Regular slide switch in either the Special or Regular position as designated by the "S" or "R" in the "Function" column.

15





Press down the quality slide switch and read the quality of the tube directly on either the A or B meter scale as specified in the "Read Scale" column.

EXAMPLE OF A TYPICAL TUBE TEST

TYPE 35Z5

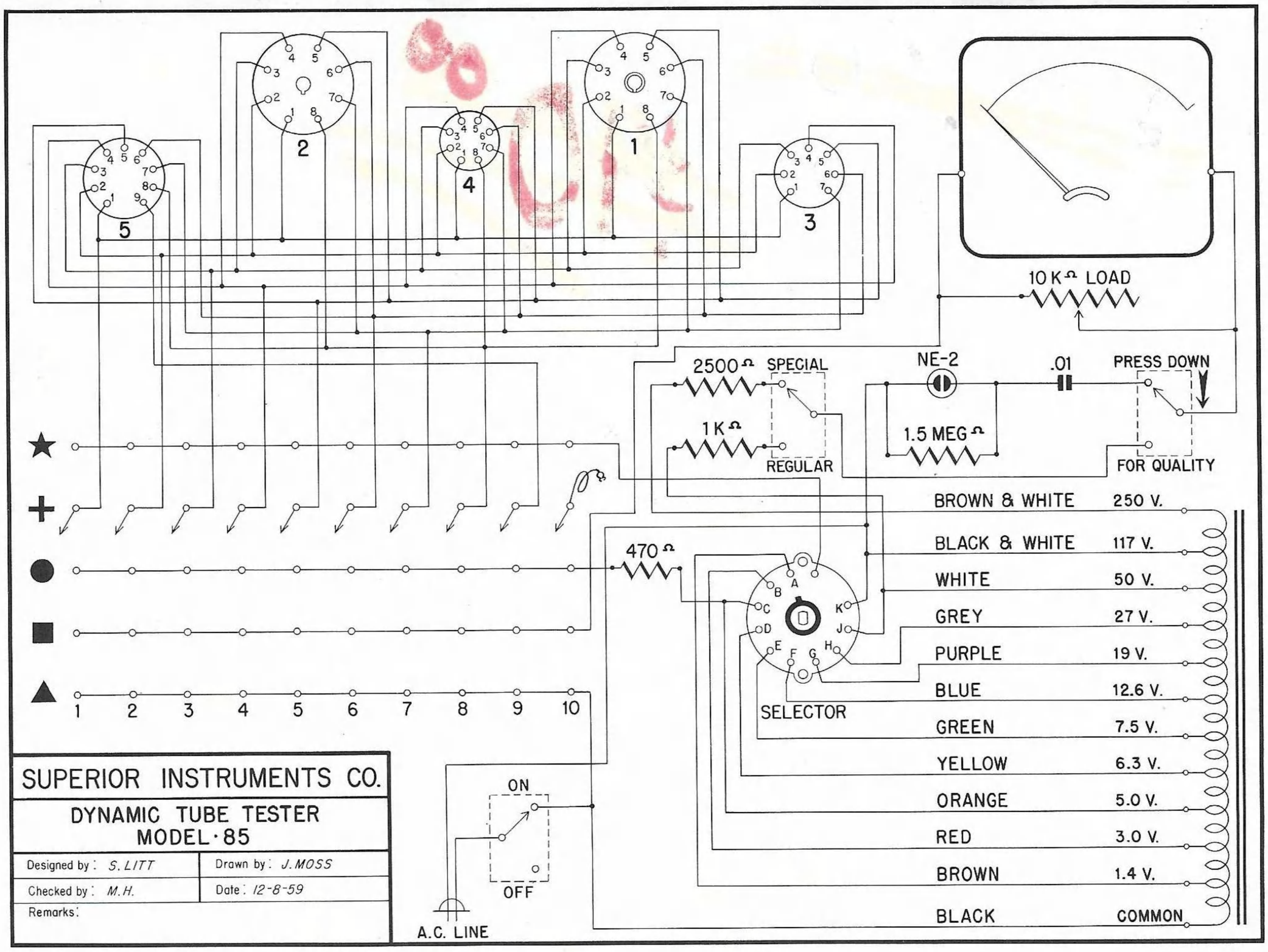
Insert the line cord into a 110 Volt AC line • Place the power switch up to the "on" position • Locate the 35Z5 data on tube chart. (Reads as follows)

Tube	Selector	★	✚	Socket	Ind. Should light	●	▲	load	funct.	Read scale
35Z5	H	2	3	2	7		5	15	R	A

Turn the "selector" switch to "H". Move the #2 lever to ★. Move the #3 lever to ✚. Insert tube in socket #2. **One at a time**, move each elemental lever switch except #2 and #3 up to ▲. Tap the tube and observe the "Short" indicator lamp. A steady glow (not temporary flash) when a switch is moved to ▲ indicates a short. Be sure to return each lever to ■ as you proceed. NOTE: #7 will glow if the tube filament is good. Now continue to check for quality. Since the ● position is blank, no lever is placed in this position. Move the #5 lever to ▲. Set the load control to 15. Set the "Special-Regular" switch to **Regular** as designated by the R in this column. Press down the "Quality" slide switch. Read the tube quality from the "A" meter scale as indicated in the "Read Scale" column.

REPLACEMENT PARTS FOR MODEL 85

Complete Meter	9.50
Meter front only	1.00
Transformer	8.00
Load Control	2.00
Complete lever switch (10 gang) assembly	6.00
Individual lever switch section	1.00
10 position selector switch	2.50
"Special-Regular" slide switch	.50
Power "on-off" slide switch	.50
"Press down for quality" slide switch	1.00
Ne-2-neon lamp	.25
.01 mfd capacitor	.15
2500 ohm — 5 watt resistor	.50
1 K ohm — 1 watt resistor	.15
470 ohm — 1 watt resistor	.15
1.5 megohm — 1 watt resistor	.15
Top-cap lead	.50
Sockets (each)	.35
7 or 9 pin tube pin straighteners (each)	.25
Cabinet	5.00
Knobs	.15


1
2
3
4
5
10 K Ω LOAD
2500 Ω SPECIAL
1K Ω
REGULAR
NE-2
.01
PRESS DOWN
1.5 MEG Ω
FOR QUALITY
470 Ω
BROWN & WHITE 250 V.
BLACK & WHITE 117 V.
WHITE 50 V.
GREY 27 V.
PURPLE 19 V.
BLUE 12.6 V.
GREEN 7.5 V.
YELLOW 6.3 V.
ORANGE 5.0 V.
RED 3.0 V.
BROWN 1.4 V.
BLACK COMMON
SELECTOR
ON
OFF
A.C. LINE
1 2 3 4 5 6 7 8 9 10
SUPERIOR INSTRUMENTS CO.
DYNAMIC TUBE TESTER
MODEL·85
Designed by: S. LITT
Drawn by: J. MOSS
Checked by: M.H.
Date: 12-8-59
Remarks: